

WE CLAIM:

1. A filter assembly comprising:
a fibrous filter media; and
a conductive electrode affixed to the fibrous filter media, wherein the
5 conductive electrode makes physical contact to the fibrous filter media in a plurality
of substantially planar locations.
2. The filter assembly of claim 1 wherein the fibrous filter media
comprises a pleated fabric.
3. The filter assembly of claim 1 wherein the fibrous filter media
comprises a plurality of parallel pleats defining pleat tips on one surface and wherein
the conductive electrode physically contacts the fibrous filter media at the pleat tips.
4. The filter assembly of claim 1 wherein the conductive electrode is
substantially planar.
5. The filter assembly of claim 1 wherein the conductive electrode
deviates no more than one millimeter variance from planar.
6. The filter assembly of claim 1 wherein the fibrous filter media is
substantially nonconductive.
7. The filter assembly of claim 1 wherein the fibrous filter comprise:
a pleated fabric having a plurality of parallel pleats;
a plurality of glue beads running in a direction non-parallel with respect to the
pleats, wherein the glue beads form a protrusion when crossing a pleat tip; and
5 wherein the conductive electrode is affixed to the fibrous filter by the
protrusion of the glue bead.
8. The filter assembly of claim 7 wherein the glue bead is substantially
non-conductive.
9. The filter assembly of claim 1 further comprising a supporting frame
surrounding the fibrous filter media and exposing an upstream surface and a

downstream surface of the fibrous filter media, wherein the conductive electrode is affixed to contact only certain points of the downstream surface of the fibrous filter media.

10. The filter assembly of claim 1 wherein the filter assembly is disposable.

11. The filter assembly of claim 1 wherein the conductive electrode makes sufficient physical contact to the fibrous filter media to collect electrical charge imparted anywhere on the fibrous filter media.

12. A method for making a filter media assembly comprising:
providing a fibrous filter media;
affixing a substantially planar conductive electrode to the fibrous filter media such that the conductive electrode physically contacts the fibrous filter media at a plurality of locations.

13. The method of claim 12 further comprising:
pleating the fibrous filter media using a glue bead to stabilize the pleats, wherein the act of affixing the conductive electrode comprises using the glue bead to affixing the conductive electrode.

14. The method of claim 12 wherein the fibrous filter media comprises a pleated media having a glue bead running across and intersecting tips of pleats, and the method further comprises:
heating the glue bead; and
pressing the conductive electrode into the heated glue bead to affix the conductive electrode to the pleated media.

15. A filter assembly made according to the method of claim 12.
16. An air filtration system including a filter assembly made by the method of claim 12.
17. An air filtration system comprising:
- 5 a blower;
- a fibrous filter media;
- a conductive electrode affixed to the fibrous filter media, wherein the conductive electrode makes physical contact to the fibrous filter media in a plurality of substantially planar locations; and
- 10 an electrical connection coupling the conductive electrode and a voltage source.
18. The air filtration system of claim 17 wherein the conductive electrode makes sufficient physical contact to the fibrous filter media so as to collect charge imparted on the fibrous filter media.
19. The air filtration system of claim 17 further comprising an upstream electrode.
20. The air filtration system of claim 17 further comprising an upstream pre-charge unit.
21. The air filtration system of claim 17 further comprising wherein the filter media is substantially non-conductive.
22. The air filtration system of claim 17 further comprising wherein the conductive electrode is substantially planar.
23. A method for removing particulates from air comprising:
- directing air flow through a filter media;
- establishing a substantially uniform electric field across the filter media;

collecting particles on the filter media, whereby charge in a collected particle
5 is distributed to the filter media;

collecting the charge from the filter media using an electrode that is physically
coupled to the filter media; and

conducting the collected charge to a power supply or ground or opposite
polarity.

24. A device, comprising an electrically enhanced air filter, the device
comprising:

a functional unit configured to perform a specific function using purified air;

an electrically enhanced air filter positioned upstream of an airflow to the
5 functional unit, the electrically enhanced air filter comprising:

a fibrous filter media;

a conductive electrode affixed to the fibrous filter media, wherein the
conductive electrode makes physical contact to the fibrous filter media in a plurality
of substantially planar locations; and

10 an electrical connection coupling the conductive electrode and a voltage source
or ground.